

EXPLORING ENTREPRENEURIAL STRATEGIC DECISION MAKING AND IMAGINATION

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Abstract

In any organization, strategic decisions are important to steer the company toward a future goal, these strategic decisions are decisions with major consequences and are related to setting out a course in order to reach strategic goals (Vermeulen & Cursue, 2010). In entrepreneurship these decisions are harder to make. Since the situation in which entrepreneurs work is new, complex, unpredictable, and entrepreneurs are subject to high time pressure (Baron, 2000).

Still many entrepreneurs seem to be successful at making these decisions. They are expected to think different than for instance managers (Busenitz & Barney, 1997), or students (McVea, 2009). Imagination might be the main characteristic setting the entrepreneurs apart from others. So therefore this research investigated the way entrepreneurs use their imagination in the process of decision making, and in particular strategic decision making. The main research question answered by this research is: *How is imagination used in the process of entrepreneurial decision making?*

In order to answer this question, first a literature study is conducted so find out what the important aspects related to imagination and decision making are. The findings of this literature study will be synthesized and a conceptual model will be made. Four propositions are formulated and represented within this model. In order to see if these propositions and the conceptual model match with practice, interviews will be held with twenty-five entrepreneurs. The interviewed entrepreneurs are experienced entrepreneurs, operating in a small to medium size enterprise, which is operating in a high tech environment. This data will be analyzed and the findings will be used to see if the propositions and the conceptual model fit the reality and if they need to be adapted.

Through the literature study three form of imagination are discovered. Prospective thinking refers to a type of thinking in which the future is pre experienced: *"prospection refers to our ability to 'pre experience' the future in our minds"* (Gilbert & Wilson, 2007, p. 1352). Perspective taking refers to the ability to put oneself in the position of someone else (Frederiks, Ehrenhard, & Groen, 2012a), and counterfactual thinking is referred to as *"the process of imagining what might have been or might still be, or comparing reality (the facts; what is) with what might have been or might still be"* (Landman & Petty, 2000, p. 300).

The data derived from the analyzed interviews points to the use of perspective taking, prospective taking and counterfactual thinking in the problem identification phase. After this phase alternative scenarios are thought of, to solve the problem. It could be that imagination is used also here, but there is not enough data to prove this, they do use other non-imagination methods such as communication analytical tools and knowledge and experience. After this step, the scenarios are evaluated, the entrepreneurs use counterfactual thinking, prospective thinking and perspective taking is this step. But the entrepreneurs use also communication, analytical tools and knowledge and experience in the decision making process. Another very interesting finding is, that entrepreneurs use a bigger, or long term goal in the evaluation of the possible alternative scenarios.

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1 Introduction

1.1 Introduction to the topic

In any organization, strategic decisions are important to steer the company toward a future goal (Vermeulen & Cursue, 2010). Strategic decisions are decisions with major consequences and are related to setting out a course in order to reach strategic goals (Vermeulen & Cursue, 2010). In entrepreneurship the future is hard to predict, since the situation in which entrepreneurs work is new, complex, unpredictable, and entrepreneurs are subject to high time pressure (Baron, 2000).

The field of entrepreneurship could be described as: *“...an inherently creative, continuously recombinative and perpetually disequilibrative process – a largely indeterminate process propelled by the spontaneous action and interaction of purposeful individuals, and stabilized by a complex array of social, political, and economic institutions”* (Chiles, Bluedorn, & Gupta, 2007, p. 488). In this type of environment uncertainty is high. According to Vermeulen and Cursue (2010) uncertainty is the inevitable element in entrepreneurial activities, and is higher than ever in the new economic landscape where change is constant. Entrepreneurs therefore tend to make decisions in a different way than for instance managers (Busenitz & Barney, 1997), their decision making is less rational and based more on cognitive decision making (Ucbasaran, 2008).

Entrepreneurs could be using other methods to cope with this uncertainty, to make good strategic decisions. Various important issues have been pointed out. For instance: The role of prior knowledge in opportunity recognition is widely described (Baron, 2006). Prior knowledge, or cognitive frameworks, developed through unique life experience, plays a crucial and beneficial role in recognizing patterns, which lead to opportunities (Baron & Ensley, 2006).

Recently however imagination is pointed out as another important factor. Important in entrepreneurship: *“... are imagination, creativity, novelty and sensitivity. It takes these qualities to develop a new product or service and bring it to market, to envision the possible impacts a new product may make and come up with novel and creative solutions to problems that may arise”* (Buchholz & Rosenthal, 2005, p. 307). Baron (2000) suggests that the principles and findings of psychology can provide beneficial insights into the factors influencing entrepreneurs' success. There is a growing number of management scholars, who state that imagination is important, but they often do not explain why it is important and in what way it is used (Frederiks, Ehrenhard, & Groen, 2012a).

In sum, the future in which entrepreneurs operate is hard to predict, and since entrepreneurship is all about the future, imagination might be an important factor helping them to make strategic decisions. These strategic decisions are important decisions that set out a course to reach strategic and crucial goals. This paper tries to shed light on the use of imagination in this decision making process the entrepreneurs use.

1.2 Research questions and objective

The main goal of this research is to develop a better understanding of how entrepreneurs use their imagination in the entrepreneurial decision making process. In order to make this research goal more specific a research question is formulated. The question focusses on the use of imagination in the entrepreneurial decision making process. The main research question is formulated as follows:

How is imagination used in the process of entrepreneurial decision making?

This is still a rather broad research question. To make this question more specific, sub questions are needed. The main question specifically aims at the process of entrepreneurial decision making. Before this can be researched, it is necessary to look at decision making theory. It is important to know if entrepreneurial decision is different from 'normal' decision making. Resulting in the following sub question:

- Does entrepreneurial decision making differ from general decision making?

This research focusses on the use of imagination within this entrepreneurial decision making process. To understand the use of imagination in decision making, first imagination itself should be investigated. The important aspect should be clear; therefore the second sub question is created:

- What are the important aspects of imagination?

When the entrepreneurial decision making is clear and the important aspects of imagination are found, there should be an indication if entrepreneurs use the imagination in their decision making. Therefore the third sub question is created:

- Do entrepreneurs use imagination in the entrepreneurial decision making process?

When it is found that entrepreneurs use imagination in their decision making process, the next logical thing to look at, is where they use it in their decision making, and for what purpose. This is addressed with the last two sub questions.

- Where in the entrepreneurial decision making process do entrepreneurs use imagination?
- What is the purpose of imagination in the entrepreneurial decision making process?

So when all the sub questions are answered, there is an indication if entrepreneurial decision making is different, if entrepreneurs use imagination in their decision making processes, and if they do where and for what purpose. This should provide a detailed answer to the main question.

In this study, the definition of an entrepreneur by Bygrave and Zacharakis (2011) will be used: "*An entrepreneur is someone who perceives an opportunity and creates an organization to pursue it*" (p. 49). This definition is chosen, because this definition does not incorporate the need for financial benefits, as other definitions might imply.

In this paper, the following definition of imagination will be used: "*Imagination is the creation of mental images of external objects, events or situations not present to the senses*" (Frederiks, Ehrenhard, & Groen, 2012a).

The entrepreneurial decision making is seen as the making of strategic decisions in the entrepreneurial process. The entrepreneurial process includes all activities which are part of perceiving opportunities and creating organizations to pursue them (Timmons & Spinelli, 2007). These strategic decisions are part of that. The strategic decisions are infrequent decisions made by the leaders of an organization that affect the organizations health and survival (Eisenhardt & Zbaracki, 1992). These decisions shape the organizations structure and its processes (Miles & Snow, 1978), and guide the organization into the future (Vermeulen & Cursue, 2010).

1.3 Research design

As a starting point of this study, a review of the literature on imagination and entrepreneurial decision making will be conducted. Since the topic is relatively underdeveloped it is hard to find recent work. Therefore articles will be also identified using a 'snowball method'. In this method, the bibliography in a useful article is used to find more useful literature. The use of this method can results in articles which are older. However this research tries to use a majority of articles from the last fifteen years in order to find the state of the art articles in this field. Through this review of the literature, a general theory will be developed for the way entrepreneurs use imagination in the strategic decision making process. The formed theory will be validated or improved by means of qualitative interviews.

In this paper an inductive approach, to explore this theory, is adopted: *"The logical model in which general principles are developed from specific observations"* (Babbie, 2010, p. 22), since a generic rule should be developed from specific observations, interviews in this case. Inductive reasoning can be used for theory building (Muegge, Sharma, & Kumar, 2005), which means that by looking at specific cases, new theory for general cases can be developed.

The data collection methods for the validation of the developed theory will be mostly qualitative. A qualitative analysis is: *"the non-numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships"* (Babbie, 2010, p. 394). The information will be gathered through interviews, the data is used to see if the initial formed theory holds, or if it needs adaptation. Further empirical testing is outside this research.

This research is of explanatory nature. Explanatory research is used to explain a topic and typically explain why questions (Babbie, 2010). This type of research is intended to explain, rather than simply describe the studied phenomenon (Maxwell & Mittapalli, 2013). The approach is inductive, since the general rule or theory is developed through the analyses of qualitative interviews from specific cases.

The interviews are going to be qualitative, which is in line with this type of research. Qualitative researchers attempt to understand or interpret the observed phenomena in terms of the meaning people bring to them (Denzin & Lincon, 2000). This type of research is open enough to find the meaning behind certain actions of the entrepreneurs. If the qualitative interviews reveal promising results, a larger empirical analysis should be conducted. However, this will not be part of this research.

In sum, first a literature review will be conducted to identify relevant theories. The found theories will be compared or combined when possible and a conceptual theory or model will be developed. To validate and improve the found theory, semi-structured interviews will be held. The gathered data will be coded and analyzed to validate and or improve the theory.

1.4 Relevance of research

In the last couple of decades in literature, more research is dedicated to look how an entrepreneur can become successful, however an important question still remains: *“do entrepreneurs think differently than other persons do? And do successful entrepreneurs differ from less successful ones in such respect?”* (Baron, 2000, p. 15). For all entrepreneurs the strategic decisions are crucial to the viability of firms (Vermeulen & Cursue, 2010). This paper proposes the idea that imagination helps the entrepreneurs to cope with the lack of complete information for their strategic decisions in the entrepreneurial process. Chia (1996) even sees imagination as the *only* true human capital in this age with smart machines.

The findings of this research can be beneficial for a couple of reasons. It can provide a first step toward discovering differences which determine the success of some entrepreneurs and the failure of others. If entrepreneurs know where in the decision making process they can use imagination rather than for instance analytical tools, they can speed up the process and might cope with uncertainty better. They can maybe also use the benefits of the imagination in other processes. When the process is speed up, they can focus their attention on other important issues. Gruber's (2007) research for example indicates that planning is beneficial, and in highly dynamic environments entrepreneurs will need to focus on select planning activities and speed up the planning task. When the entrepreneurs can use imagination to fill in the missing information for instance, they can speed up planning.

The entrepreneur's personal goals, characteristics and strategic awareness have a significant impact on the firms' development, and especially for rapidly growing small high tech firms strategy formulation is important, if not essential, for successful long term development (Berry, 1998). This points out that in these high tech firms, the strategy formation and thus strategic decision making is important, and that in these firms it is closely linked to the characteristics of the entrepreneur. In other words, the strategic decision making process is closely linked to the characteristics of the entrepreneur, of which imagination might be one of the most important characteristics.

In sum, there is a growing interest in answering the question of how entrepreneurs think differently (Baron, 2000). Imagination might be the main characteristic setting successful entrepreneurs apart from less successful ones. In the field of entrepreneurship, where the future is uncertain and hard to predict (Sarasvathy, 2001b), strategic decisions are hard to make. So researching the way entrepreneurs use their imagination in the process of decision making, and in particular strategic decision making, is a big step in discovering if imagination is an important factor determining successful entrepreneurs. Little attention to this field is paid by literature, this research addresses this gap and tries to develop an initial understanding of the way in which entrepreneurs use their imagination in the decision making process.

2 Theoretical framework

In this chapter first a general overview of the development of imagination research is given. The different standpoints and important items regarding imagination are described, and the different ways in which imagination can be used are discussed. After which entrepreneurial decision making and the role of knowledge and experience within it is explained. Please note that the literature discussed is not meant to be exhaustive. The discussion is meant to shed light on the important issues of interest with regard to this research and to give the reader a better understanding of the topic in general.

2.1 Imagination

In this chapter the related topics and imagination are described. It starts with the importance of imagination and then it is followed by the explanation of the different types of imagination, and it ends with a short conclusion. There are also some terms that are closely associated with imagination, like creativity (Hennessey & Amabile, 2010) and day dreams (Sorenson & Stuart, 2008) adopted from Frederiks et. al. (2012a)), but these will be mostly outside the scope of this research.

Importance of imagination

Imagination is gaining in popularity in entrepreneurship research. It is remarkable that it is often used without properly defining what is meant by it. Some authors define what it is not: imagination is different from daydreams or fantasy, since it is based on knowledge and therefore the imagination is constraint (Chilles et al. 2010). Chia (1996) also points out these boundaries but states that these boundaries can be crossed by those who desire. Chilles et al, (2010) also point out that the imagination can be constrained; however it cannot be coordinated, since each individual can imagine a different future at each moment in time, and entrepreneurs change their plans constantly.

This paper adopts the definition used by Frederiks et al.: *“Imagination is the creation of mental images of external objects, events or situations not present to the senses”*¹. Sometimes researchers use the term mental simulation, this paper sees mental simulation, as imagination. Others might disagree, however since the definition of imagination used here, sees imagination as the creation of mental images. Therefore these mental simulations are seen as imagination.

This process of imagination offers varied and new possibilities for what nascent organization might choose to pursue by allowing for completely new thoughts and completely new imagined scenarios, and permits the envisioning of an entirely new future (Felin & Zenger, 2009). Imagination also lets entrepreneurs combine resources that are not only novel, but also meet customers' desires (Chiles et al, 2010). Entrepreneurs also must imagine the product or service that they will develop, the market that needs it and what resources and capabilities are requires and the activities that are needed to exploit the perceived opportunity (Keating & McLoughlin, 2010).

Imagination can be used to probe, or test the future without any large consequences (Felin & Zenger, 2009). It avoids the costs and time to physically experiment, since before the actual trial, the mental trial and error provides much needed guidance and learning for the opportunities the organization

¹, Definition: Frederiks, Ehrenhard, & Groen, 2012, retrieved from first author

might pursue. Especially in entrepreneurship it is important to be able to probe into the future, since entrepreneurship is all about the future (Sarasvathy, 2001a) and all about novelty (Chiles et. al, 2010). Chia (1996) characterized today's world as unpredictable volatile and dynamic. The entrepreneurs face this uncertainty since the market change is unpredictable, but knowing that change will occur helps entrepreneurs assemble resources in configurations that anticipate and shape future markets (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010). When preparing for this uncertain future mental simulation is important, it enables people to return to past events, alter them, and project multiple alternatives for future events (Escalas, 2004).

Imagination is used by the entrepreneurs to come up with several scenarios and to simulate them in order to pick the most valuable one. Scenarios are generated at two places in time: first at the start of the problem, and second when the scenarios available are not consistent with the data (Dougherty, Gettys, & Thomas, 1997). At the start of the problem scenarios are generated to come up with a solution. When after evaluations the scenarios seem to be not usable the need arises for more scenarios to choose from. Two factors which affect the perceived likelihood of the focal causal scenario are the number of alternative scenarios people construct and the likelihood of the alternative scenarios (Dougherty, Gettys, & Thomas, 1997). The imagination helps the entrepreneur to visualize or pre experience these alternative scenarios. These scenarios can be originated from recombinations or they can be radically new.

As Felin and Zenger (2009) explain, imagination provides one of the key engines of entrepreneurial theorizing. Entrepreneurs imagine possibilities for courses of future action and thereby add new possibilities to a set of fragmented observations and expectations. Imagination then essentially adds to, and creates the entrepreneurial possibility space bounded by knowledge. According to Vanharanta & Easton (2010) mental simulation serves different purposes: First it can be used to assess why the current situation is as it is. Second it can be used to project the future using the current situation as a starting point. And third it can be used to fix the current state and an (ideal) future state and use the mental simulation to describe how the future state is achieved from the current state. This is possible, since there are different forms of imagination. There are three forms of imagination, perspective taking, prospective thinking, and counterfactual thinking (Frederiks, Ehrenhard, & Groen, 2012b). The future oriented imagination is called prospective thinking and is explained in the paragraph below.

Prospective thinking

In this paragraph prospective thinking is elaborated. The term *prospective thinking* is not that often used in literature; often it is called differently. It is sometimes referred to as mental simulation, imagination or visualization. Prospective thinking is a part of imagination, it consists of the words thinking and prospective: "*prospection refers to our ability to 'pre experience' the future in our minds*" (Gilbert & Wilson, 2007, p. 1352). So prospective thinking refers to a type of thinking in which the future is pre experienced.

Often in literature the term imagination is used in this way, however the correct term would be prospective thinking. For example: mental simulation can be used to project the future using the

current situation as a starting point (Vanharanta & Easton, 2010). In this example for instance prospective thinking would be the correct term.

Prospective thinking is a tool to probe the future by creating various alternative scenarios, and through this simulation an improved awareness is achieved, it assists in the formation of situation awareness and the generation of expectancies to verify situation awareness (Vanharanta & Easton, 2010).

Felin and Zenger (2009) use the term entrepreneurial imagination when they talk about the generation of possibilities. Entrepreneurial imagination is according to Felin & Zenger: *“a uniquely creative and generative act for supposing, conceiving, and considering various new possibilities (and, impossibilities for that matter) for courses of entrepreneurial action”* and *“Entrepreneurial imagination and theorizing explain the remarkable success with which entrepreneurs recombine”* (Felin & Zenger, 2009, p. 134). In other words, the entrepreneurs use prospective thinking, to generate new possibilities and because they can simulate several scenarios they can recombine for instance resources in unique ways. It allows them to hypothesize about possible (re)combinations and to focus their attention on those with a higher likelihood of success. The entrepreneurs have to choose between the possibilities because not all can be physically tested. These imagined possibilities need to be resonated and justified towards more full-fledged conjectures, hypotheses, models, and theories which shape entrepreneurial actions and strategy (Felin & Zenger, 2009).

Through prospective thinking, the imagining of the future, entrepreneurs can look at and get a better understanding of the future. Entrepreneurs can create novelty and introduce it into the system through forward-looking creative mental acts, and they can do it continually using their individual imagination from moment to moment (Chiles et al.2010). Entrepreneurs formulate plans not only oriented to their subjective interpretation of the past, but also to their interpretation of an imagined future. These plans or scenarios might act as goals, which can help them focus attention (Phillips, 1996).

In sum, prospective thinking is often used without using the correct term. The prospective thinking helps the entrepreneur to get a better understanding of the future. The creation of scenarios for instance helps to pick the best possible scenario, and to probe the future. This also helps the entrepreneur to focus on the important aspects of the scenario.

Counterfactual thinking

Another aspect of imagination is counterfactual thinking. This is the mental simulation which can be used to assess why the current situation is as it is (Vanharanta & Easton, 2010). Some researchers suggest that entrepreneurs are less likely to engage in counterfactual thinking (Baron, 2000) however it is part of imagination and entrepreneurs could use it. Counterfactual thinking is referred to as *“the process of imagining what might have been or might still be, or comparing reality (the facts; what is) with what might have been or might still be”* (Landman & Petty, 2000, p. 300). In other words, it is the process of thinking about how this current situation has become what it is, or thoughts about what could have been different in the current situation if things had went in a different way. It can be thought of in the future, or in the past.

Counterfactual thinking is the imagining of alternatives to past outcomes (Roese, 2000). Byrne (2005) describes counterfactual imagination as speculations and thoughts about what might have been important in a past situation. Counterfactual thinking is used to refer to the imagining of alternative outcomes in the present or future, after the fact has happened (Landman & Petty, 2000). So in other words counterfactual thinking is the imagining of what could have happened if other actions were chosen (or had happened). Counterfactual thinking is important because this type of imagination can help entrepreneurs understand what went wrong in the past and this can help them to improve future actions (Landman & Petty, 2000).

In the process of counterfactual thinking there is a distinction between upward counterfactual thoughts and downward counterfactual thoughts (Roese, 2000) (Landman & Petty, 2000); *upward* counterfactual thoughts are imaginary alternatives which are better than reality, *downward* counterfactual thoughts on the other hand are imaginary alternatives which are worse than reality. Often counterfactual thinking results into emotions (Landman & Petty, 2000). The fact that researchers like Baron (2000) found that entrepreneurs are less likely to engage in counterfactual thinking, can also explain the success of entrepreneurs. If entrepreneurs do not engage in counterfactual thinking, they are not subjected to possible negative emotions, and therefore they might be more confident, and see positive opportunities while others see them as risky. The use of counterfactual thoughts can also be helpful in a way. The thinking about what could have gone wrong or what could have been done in a better way can help to get a clear image of the situation. This can help improve future actions.

In sum, counterfactual thinking refers to imagining alternative outcomes to past or future situations. The counterfactual thinking can be used to get a better understanding of the future. By looking at what went wrong or could have gone better in the past, the entrepreneur can focus on the important things. Furthermore they can create different scenarios for the future, and pick the most suitable one. Counterfactual thoughts can also result into emotions, but entrepreneurs are probably less likely to engage in counterfactual thinking, and less prone to experience feelings like regret.

Perspective taking

The ability to take the perspective of someone else is also part of imagination. Perspective taking refers to the ability to put oneself in the position of someone else (Frederiks, Ehrenhard, & Groen, 2012a). This is important, because; in the high-tech industry successful entrepreneurs manage to match technical discoveries with the buyers' needs and possess the stamina, knowledge, skills, and abilities to deploy their offerings in the market (Markman & Baron, 2003). The ability to match technical discoveries with the buyers' needs is very important, so the needs of the customers should be envisioned. The four most important factors in the success or failure of an innovation are directly related to customers: ability to meet the customers' needs and the customers' attitudes towards new innovations, ability to see benefits and willingness to switch (Baronet & Queenton, 2011). This is especially important when events are simulated, because the simulators' actual or potential behavior is the subject, mental simulation typically involves oneself (Escalas, 2004).

The taking of a perspective, results if trying to feel what the other would feel, so emotions such as empathy automatically follow. Chiles et al. (2010) define empathy as an imaginative transporting of taking another's role, placing oneself into another's shoes, and perceiving the situation from another perspective. Sometimes empathy is used, while the correct term would be perspective taking: Entrepreneurs use *empathy* to imagine the needs of a future customer, which lets entrepreneurs understand the problems others face, and this constrains the entrepreneurial imagination to form a valuable solution (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010). In this example the correct term would be perspective taking. The perspective taking in its turn can result in empathy.

Dahl et al. (1999) found that including the customer in the imagination imagery constrains the solution space by providing boundaries and focused the imagination. Entrepreneurs use imagined future customer desires as criteria to determine the appropriateness, which constrains the entrepreneurial imagination by separating the value from the novelty (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010). The entrepreneurial success depends on the ability to imagine the problems that potential customers face; entrepreneurs use empathy to identify the potential customer's problems (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010). Dahl et al. (2001) points out that empathy is needed to envision the needs of the end users and that empathy can improve the usefulness of the design. If the customer is not included in the design, the design is less useful (Dahl, Chattopadhyay, & Gorn, 2001). Furthermore, by envisioning oneself performing a certain behavior and picturing the various steps involved in the consumption of a product the customer can better predict the consequences of the actual consumption (Phillips, 1996). So with the use of perspective taking the needs and consequences of the new product can be better predicted, which helps to improve the design.

In sum, perspective taking, is often meant, but it is often referred to as empathy, which is a possible consequence of perspective taking. It is needed to envision the needs of future customers. The perspective taking constricts the imagination, and helps to focus the design. Without the perspective taking the designs are less useful for the customers.

Conclusion

To conclude, imagination is gaining attention in research. It is often used without properly defining it. There are also misunderstanding on the ways of thinking imagination comprises of. They are often mixed and or used in a way which is not fully correct, which is a result of the lack of common definitions.

Imagination consists of; prospective thinking, counterfactual thinking, and perspective taking. All three are potentially important in helping the entrepreneur become successful. Imagination is bounded by knowledge, and it is a low cost way of probing the future, helps to understand the current situation, and helps the entrepreneur to focus on the needs of the future customer.

2.2 Entrepreneurial Decision Making

The performance of an organization depends on the making of good decisions; this is also the case in entrepreneurship. However literature suggests that entrepreneurs make decisions in a different way. McVea (2009) states that entrepreneurs apply decision making approaches that are: less rational, less

comprehensive and more reliant on heuristics and that they consider different sources of information in different ways than non-entrepreneurs. They prefer intuitive decision strategies, especially under conditions of time pressure, ill-defined goals and dynamic conditions (Vanharanta & Easton, 2010). Intuition is often used in combination with imagination, or when imagination is meant. However, it is a way of processing information with cognitive and affective elements, which results into direct knowing without using conscious reasoning (Sinclair & Ashkanasy, 2005). The absence of consciousness indicates that the person is not really aware of the things that happen, in imagination however a person is aware and controls the imagination. So the two should not be mistaken, this paragraph tries to elaborate on the different theory regarding entrepreneurial decision making.

Strategic decisions and entrepreneurship

Organizations performance is associated with the making of successful strategic decisions. Strategic decisions are often described as 'unstructured', 'unprogrammed', and 'messy' (Schwenk, 1995). However there are some rules to categorize a decision as being strategic. A decision is a strategic decision when: (1) the decision is directed toward defining the organizations relationship to its external environment, (2) the decision encompasses the entire organization, (3) the decision depends on input from all of the primary functional areas in the organization, (4) the decision has a direct influence on all of the administrative and operational activities throughout the organization, and (5) the decision is vitally important for the long-term well-being of the total organization (Harrison & Pelletier, 2001). A Strategic decision is successful when the strategic decision does what it was intended to do, within the given constraints (Harrison & Pelletier, 2001).

There are different opinions regarded to the making of successful strategic decisions. Eisenhardt and Zbaracki (1992) discuss the difference between rationality and bounded rationality. In the rational model, the actors gather the appropriate information, develop a set of alternative actions, and then select the optimal alternative (Eisenhardt & Zbaracki, 1992). According to Eisenhardt and Zbaracki (1992, p. 22): "*Strategic decision makers are rational in some ways, but not in others*". They make rational plans but also act quickly on incomplete information; they also develop many alternatives, but only thinly analyze them (Eisenhardt & Zbaracki, 1992). The decision making is often not completely rational, but bounded rational, they satisfice instead of optimize, rarely engage in a comprehensive search, and discover goals in the process of searching (Eisenhardt & Zbaracki, 1992).

Harrison and Pelletier (2001) explain that the attitude towards the process of decision making and the decision itself are important. To make a successful decision, the basis should be a judgmental strategy rather than computational (Harrison & Pelletier, 2000). In a judgmental strategy a manager chooses a given alternative, in the presence of considerable uncertainty, based on judgment applied to less than perfect information. In a computational strategy a manager presumes to know enough about the outcome and attempts to choose an optimal outcome, or one that results in the highest possible attainment of the objective. The uncertainty of the outcome in decision making limits the search for an optimal choice, but: "*strategic decision makers should accept their innate limitations and acknowledge the uncertainty inherent in strategic choices*" (Harrison & Pelletier, 2000, p. 109). This uncertainty

comes from the imperfect information available, time and cost constraints, and cognitive limitations (Harrison & Pelletier, 2000).

The strategic decisions entrepreneurs take are suggested to be of entrepreneurial nature, and entrepreneurs take decisions in a significant different way compared to for instance students (McVea, 2009), or managers (Busenitz & Barney, 1997). Entrepreneurial decision making refers to, or involves, the way entrepreneurs use cognition to make assessments, judgments and decisions related to entrepreneurial activities such as opportunity evaluation, venture creation and growth (Mitchell R. K., et al., 2002). These entrepreneurial activities are considered to be of strategic nature, because they meet the above mentioned criteria for strategic decisions. However literature makes a distinction between the decisions making of entrepreneurs and the decision making by for instance managers (Busenitz & Barney, 1997). Entrepreneurs are expected to make use of less rational/analytical decision making tools, and build their decisions more on their mental processes, since they usually operate in a dynamic environment and they have to make quick decisions.

Use of knowledge and imagination

In literature regarding the entrepreneurial decision making, often knowledge or experience is mentioned. Many researchers discuss entrepreneurs' interpretation of the past experience and prior knowledge (Simon 1997; Chiles et al. 2010; Baron & Ward 2004; Braun et al. 2002; Felin & Zenger 2009; Dahl et al. 1999).

Dahl et al. (1999) say that memory refers to events or occasions that have been personally experienced or observed. Baron and Ward state: *"Information we have acquired through life experiences is stored in memory- our cognitive system for storing information"* (2004, p. 563). So knowledge and experience are both stored in the memory of a person, so both experience and knowledge will be stored in memory.

According to Felin and Zenger (2009) perception and experience are important, but they cannot explain the origins of radically new beliefs. They point out that novel strategies and entrepreneurial opportunities routinely extend beyond individuals' and organizational (or society's for that matter) prior experience. For new organizations in particular, experience is inherently not available, but despite this lack of experience these novel organizations create disproportionate amounts of value (Felin & Zenger, 2009). This suggests that entrepreneurs are somehow able to get a better perception and beliefs about opportunities in the environment than more experienced organizations (Felin & Zenger, 2009).

The imagination includes the use of memory, not as retrievals from static memory, but as active reconstruction of the past in light of present circumstances and anticipation of the future (Carlsen, 2006). Which means that memory helps to imagine the future. According to Chiles et al. (2010) images based on visual memory are used in imagination, but recombined in a novel and previously unseen way. For example if you imagine a flying car, the images of a car and the ways you can fly come from your memory. They are combined in a new way to create a visual image of a flying car. So memory is

needed as a starting point, but to create something radically new, imagination is needed. As the great inventor Albert Einstein said: *"Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution"* (Einstein, 1929).

There is a need for both memory and imagination to come up with radically new ideas. Keating and McLoughlin state that: *"The entrepreneurial imagination is made up of diverse connections in knowledge that give rise to an opportunity and impacts on the plans to develop a new venture over time. This is informed by the knowledge and experience of actors involved in the venture"* (2010, p. 998). In other words, the imagination is informed by the knowledge and experience, and thus memory, of the actors in the venture.

Dahl et al. (1999) researched the use of both memory and imagination. *Memory* refers to the use of one event or occasion that one has personally experienced or observed, and *imagination* visualization which refers to the creation of a new never before experienced event (Dahl, Chattopadhyay, & Gorn, 2001). According to the authors, two types of imagery, the visualization of a new idea, exist. One type is based upon imagination and is called *imagination image*, while another is based upon memory and is called *memory image*. An imagination image differs from a memory image, as it does not recall a prior experience, instead a new never seen before experienced event is constructed in the mind. Note that imagination imagery also involves prior memory. The images based upon memory can provide a good starting point, but relying on them limits the full potential. Chia (1996) says that knowledge and analytical problem-solving capabilities restrict imagination and resourcefulness. The results of Dahl et al. (1999) show that imagery based on imagination results in more original design than imagery based on memory. This can be explained by the finding that exposure to examples of previous ideas or work can greatly restrict creative thought: *"If prior examples stimulate heuristic thinking (e.g., a tendency to incorporate features of existing products into new ones), they may prevent entrepreneurs from engaging in the analytic thought that may often be necessary for creative cognition"* (Baron & Ward, 2004, p. 467). So the generation of new ideas based on memory can be restricted by the same memory. Chia (1996) also shares the opinion that knowledge and analytical problem-solving capabilities restrict imagination and resourcefulness.

Entrepreneurs can create novelty and introduce it into the system through forward-looking creative mental acts, and they can do it continually using their individual imagination from moment to moment (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010). Entrepreneurs formulate plans not only oriented to their subjective interpretation of the *past*, but also to their interpretation of an *imagined* future. The plans are according to Chiles et al. (2010) oriented on their knowledge, but also and especially to their expectations derived from imagined future possibilities.

This seems to be straight forward, however there is also the contradictory finding that: *"Those who are imaginative have little experience while those who are experienced have feeble imaginations"* (Chia, 1996, p. 415). This can help explain why new companies usually rely more on imagination, and create more radically new events than existing companies. This does not mean that existing companies cannot come up with the same radically new ideas, but that it is less likely that they will. Because more

experienced companies rely more on their experience, this hinders their capability to come up with radically new ideas.

Therefore a balance should be sought to create a good mix of imagination and memory. This balance also depends on the environment, if the environment is stable, companies rely more on their experience since the change is minor. If the environment is uncertain companies cannot rely on their experience, since the future is probably going to be completely different from what they have experienced so far, and they therefore need to rely more on imagination.

In sum, experience and knowledge are both part of memory. The use of both memory and imagination are expected to help the entrepreneur with decision making. The memory is needed as a start and the imagination is used to (re)combine the known factors and combine them into (radically) new ideas, products etc. Entrepreneurs are expected to use more imagination, which allows them to create more value and newer ideas than exist in memory. Since the imagination is bounded by memory so for the best results, both memory and imagination are important in making of good decisions.

2.3 Conceptualization

In this chapter the findings off the literature review will be synthesized into a conceptual model. This model will be further validated with interviews. For the conceptualization of the use of imagination within the decision making process, it is important to understand the decision making process.

The decision making process consists of several steps, and although different researchers use different steps and a different number of steps², there is some common ground. Most researchers agree that the start of the process is to spot a need or a problem and to identify the problem (Simon, 1997; Li, 2008; Szulanski & Amin, 2001). The formulation of the problem is already a problem solving task (Simon H. A., 1997). It takes time to identify the underlying cause of the problem, but it is important to make a good decision. The problem statement should be broad enough to accommodate many alternatives, but narrow enough to accommodate a *manageable* number of alternatives (Szulanski & Amin, 2001).

After the identification phase, the next step is to search for possible options (Li, 2008; Szulanski & Amin, 2001; Simon, 1997; Harrison & Pelletier, 2000). Different than in most situations, the options for which the organizations are searching, do not exist, but need to be created and designed (Simon H. A., 1997). The number of alternatives and the variety between the generated alternatives influences the likelihood of finding a suitable option (Szulanski & Amin, 2001). After the set of alternative options is complete, the options need to be evaluated and the option with the highest likelihood of achieving the objective is selected (Li, 2008; Szulanski & Amin, 2001; Harrison & Pelletier, 2000). The last step after this selection is the implementation of the chosen option and the progress should be monitored (Li, 2008; Harrison & Pelletier, 2000).

² For instance Li (2008) uses eight steps, Simon (1997) uses four steps Harrison & Pelletier use an more elaborate cyclic process model

All these steps form the basis of the decision making process. These steps are combined with the important findings from the literature review and visualized in a model (see Figure 1 The role of imagination in decision making).

This research focusses on the use of imagination within the decision making process. As visualized in the model; it is expected that the imagination has an influence on all the steps in the decision making process. The implementation phase is the last step in the decision making process, however since the actual decision is already made by that time; this research focusses on the first three steps. The imagination is expected to help the entrepreneurs make decisions in the uncertain environment. Imagination helps the entrepreneur to make sense of the complex and uncertain environment, and therefore has a reducing effect on the risk and uncertainty. As often pointed out, most (if not every) decision comes with risk and uncertainty. Risk and uncertainty can both threaten the success of the decision and the survival of the firm (Keating & McLoughlin, 2010). The entrepreneurs are expected to use their imagination in the decision making process to lower the uncertainty and risk involved in the decision. The more information is known about the uncertain future, the better informed the entrepreneurial decision is. However since this is not the focus of the research, it will not be further investigated in the interviews.

In literature, the use of knowledge and experience is pointed out to be beneficial in the decision making as well, next to imagination. This research shares the opinion that without knowledge there cannot be imagination. The imagination is as described earlier: *Imagination is the creation of mental images of external objects, events or situations not present to the senses*³. In order to create a mental image of certain objects, events or situations, there should be at least some understanding of the real world and its limitations and possibilities. Therefore the knowledge and experience, which are both stored in memory are incorporated in the conceptual model.

Propositions

There are some expectations with regard to the model. The interviews will be analyzed for these propositions. After which the propositions will be validated or adapted. These propositions are also represented in Figure 1 The role of imagination in decision making". These are the expected propositions:

Proposition 1: In the problem identification phase all three forms of imagination will be used.

When identifying a problem, prospective thoughts can be used to see where the entrepreneur wants the company to go to. When the entrepreneur knows the future situation, he can see if the company is ready for this future, or if it needs certain decisions, using perspective taking from the company's perspective. Counterfactual thoughts can also be used to think of several scenarios, which might reveal threats or opportunities for which decisions should be made. Perspective taking can also be used; one can take the perspective of a customer or supplier and see if they value the company, and how the company can improve, or to identify new market to pursue.

³ Definition: Frederiks, Ehrenhard, & Groen, 2012, retrieved from first author

Proposition 2: With the generation of possible alternative options prospective and counterfactual thoughts will be mostly used.

When possible alternative options need to be developed to offer different solutions, prospective thoughts can be used to see what will happen in the future, and develop a strategy to steer towards that future. Also thoughts on for instance future technology or situations might help to create possible solutions. Counterfactual thoughts can be also used to think of different scenarios, and what will happen. It does not seem likely that perspective taking is used, since others like for instance the customers or suppliers do not know situation of the company, so using their perspective does not seem helpful.

Proposition 3: In the evaluation of the alternatives and selection of the option counterfactual thoughts and perspective taking will be mostly used.

When evaluating the various options, counterfactual thinking is expected to be used the most. Thinking of 'what if' can help to get an understanding of the consequences of a certain scenario. The counterfactual thinking can also help to see the weaknesses and dangers of the certain scenario in the future. The perspective taking is expected to be used to see from the perspective of the customers, suppliers, or other stakeholders, if the scenario would be valued by them as well. Also looking at the scenario from different perspectives can help to spot things that might have been overlooked so far. The prospective thinking; thinking of what the future might look like, can also be used to match the scenario, however it is expected to be used in fewer instances.

Proposition 4: The imagination is influenced by memory

As explained before, this paper sees the use of imagination as being influenced by the knowledge and experience. These knowledge and experience are stored in memory. The imagination is expected to be influenced by this memory.

In sum, the conceptual model is a model derived from the literature review. This model explains how the entrepreneurs are expected to use imagination in the process of making strategic decisions. The entrepreneur is expected to use imagination in the steps of the decision making process. This model is conceptual and interviews will be held with entrepreneurs to see if the initial model holds, or if it needs adaptation. Therefore four propositions are described, that will be further validated or improved by the results of qualitative interviews.

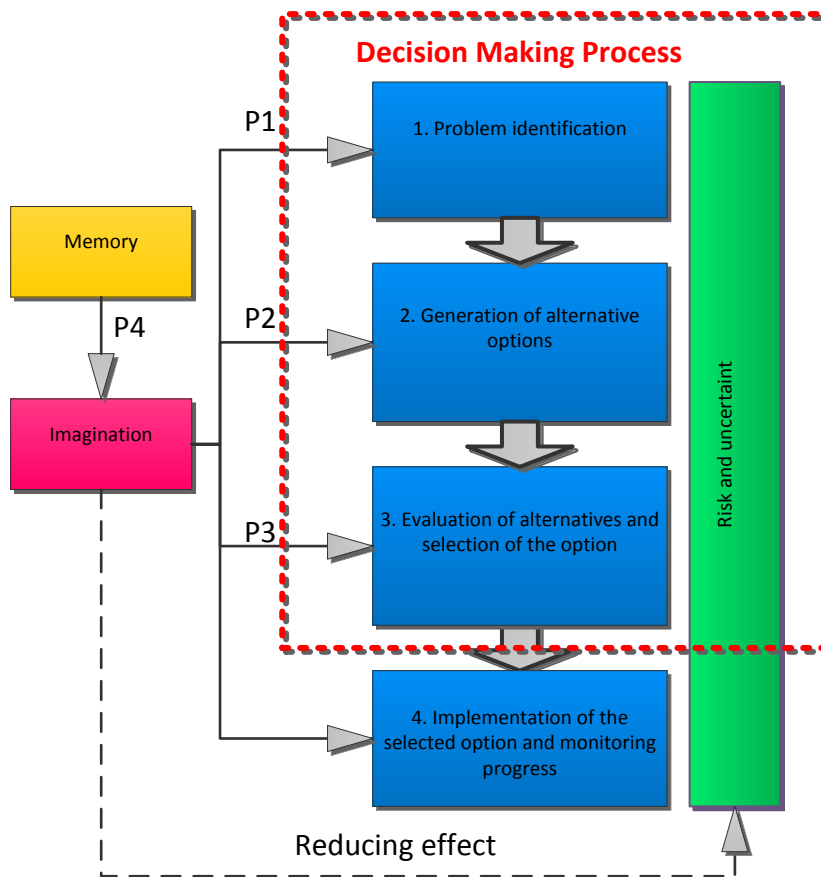


Figure 1 The role of imagination in decision making

3 Methodology

In this chapter the methodology will be further outlined. In short the conceptual theory derived from literature, which is summarized in the model in previous chapter, will be further improved using data from interviews with entrepreneurs. The results from those interviews will help to validate and further improve the conceptual model.

Interviews

The data collection will be done by means of interviews. These interviews will be semi-structured, which means that the interviews are held with a structured list of predetermined questions. This makes sure that all interviewees are asked the same questions, but when needed additional questions can be asked. Semistructured interviews are used because: “*Semistructured interviews provide practitioners with opportunities to develop a report with members of the organization and learn about critical areas that are not readily accessed through standardized questionnaires*” (Brinkman & Rog, p. 336). When using this method, the standard questions will be the same for every interviewed entrepreneur, so they can be compared and analyzed. When an interesting topic emerges, which is not in the questionnaire, additional questions can be asked accordingly. The questionnaire should reflect the key topics identified through the literature review, which are the propositions discussed previously. After the interviews are conducted, coding will be used to group the given answers so they can be analyzed

effectively. In qualitative research, the purpose of coding is to fracture the data and rearrange it into categories that facilitate comparison between things in the same category and between categories (Brinkman & Rog, 2009). Such categorizing makes it easier to develop a general understanding of what is going on, but one should be careful not to neglect contextual relationships among the data (Brinkman & Rog, 2009).

Subject of research

These interviews will be held with experienced entrepreneurs from micro and small-sized enterprises in a high tech environment.

There are researchers such as Felin & Zenger (2009) that see entrepreneurial actions as a team effort. This paper agrees that an entrepreneurial team can be used, but treats the entrepreneurial action as a solo endeavor. Felin and Zenger (2009) also state that when the teams are aligned: the members think and imagine things in a similar way. This also means that by interviewing one member, the results should be similar as to interviewing the team. Furthermore there is usually one initiator with the highest decisive power, and therefore entrepreneurship is treated as a solo endeavor in this research.

According to Ucbasaran (2008) entrepreneurs with high levels of experience approach problems in a different way than novice, however it takes time to develop this expertise, and the development of this entrepreneurial expertise requires both success and failure (2008).

Interviewing experienced entrepreneurs should provide a better insight in the use of imagination, since: experienced entrepreneurs are more focused on the actual starting and running of the new venture, while novice (first time) entrepreneurs focus more on the newness and novelty (Baron & Ensley, 2006). It can be argued that by surviving more experienced entrepreneurs are already successful to a certain extent (Keating & McLoughlin, 2010). New ventures can take a long time to develop; they can cause a delay in the data (Keating & McLoughlin, 2010). Sometimes managers can use explanations like it was intuitive, because they hide their real motivations, or they try to hide flaws in their logic (Vanharanta & Easton, 2010). Therefore the experienced entrepreneurs should have a better understanding of why they perform certain actions. They also should be more capable to identify where and in what way they make decisions. They should also be in a better position to judge if this use of imagination within the decision making is beneficial.

This paper focusses on the entrepreneurs in micro and small enterprises, which are organizations with an Annual Work Units' head count up to 50 workers (European Commission, 2005). The focus on micro and small enterprises is relevant since in those companies it is often the entrepreneur itself who has to make the strategic decisions, and the decision making process is less rational and political than in large firms (Vermeulen & Cursue, 2010). There are also features that set these companies apart with regard to the environment. Unlike managers in large organizations, entrepreneurs do not have access to extensive information (Vermeulen & Cursue, 2010), in large companies managers tend to be supported by staff members who gather information and continuously monitor the environment (Busenitz & Barney, 1997). Micro and small companies are also expected to face more risk and uncertainty. In uncertainty the possible options and outcomes are unknown in advance, risk refers to

the situation were all the options can be known, but with no certainty over which option is likely to have the best outcome (Mazzarol & Reboud, 2011). Risk and uncertainty are often used together.

People who are in situations where they face uncertainty and complexity, use heuristics, biases and paradoxes which act as short-cuts to help them to make a decision (Busenitz & Barney, 1997). Therefore the use of imagination should be more present in organizations where the Strategic Decision Making process is less rational and there are fewer resources for gathering information. So in Small Medium Enterprises there is a higher chance of identifying the use of imagination and memory by decision makers, to help serve as a way to cope with uncertainty and complexity. If decision makers lack important pieces of information, they try to forecast the missing pieces (Vermeulen & Cursue, 2010). Entrepreneurships nature demands that entrepreneurs must often make quick decisions with incomplete information (Tan, 2001). This implies that if entrepreneurs use imagination in their SDM process, it should be more clearly present and visible in SMEs in a complex environment. However the degree of this complexity and uncertainty varies depending on the industry in which the SME operates (Vermeulen & Cursue, 2010), so it is not necessary valid for all industries.

In high-tech businesses especially the role of the entrepreneurs' personal characteristics is significant, and the strategic planning crucial (Berry, 1998). Therefore the use of imagination and memory by the entrepreneur should be more visible in high tech environment. In a high tech company the degree of complexity and uncertainty is usually also high which might lower the usefulness of analytical tools and increases the need for imagination.

High-tech means that there is a high uncertainty about the market (Moriarty & Kosnik, 1989). A company is high-tech, when it has a strong scientific-technical base and has been set up for the purpose of exploiting an invention or technological innovation (Berry, 1998). High-tech consists of two words, high and technology. As Moriarty and Kosnik (1989) explain, technology consists of practical knowledge, know-how, skills and artifacts. This definition includes also the management technology, the knowledge of how to market the product and run the business (Moriarty & Kosnik, 1989). This means that high-tech companies are companies with a strong scientific-technical base with the purpose of exploiting an invention or technological innovation, and they usually operate in a market with high uncertainty.

In sum, there are three main factors which should be looked at when selecting subjects for the research. In these conditions it is expected that there is a higher change of finding imagination used in decision making by the entrepreneur itself. The three main factors for selecting are:

1. The entrepreneurs should be experienced.
2. The organization should be micro to small.
3. The organization should operate in a high-tech environment.

Sampling

The sampling method, used to select entrepreneurs for the research, would be convenience sampling. The convenience sampling would be mainly in the eastern part of the Netherlands. A convenience sampling method is a non-probability sampling method. This type of method can be used for applied research to collect data about, for instance, a group from whom it would be too costly or too difficult to

use probability sampling methods (Brinkman & Rog, 2009). A non-probability sampling method is chosen, which means that the subjects are not selected randomly. The data that will be gathered is of qualitative nature, through semi-structured interviews. It would be too time consuming to use a probability sampling method, and not every selected subject might be willing to make time for the interview.

This limits the generalizability, however according to Denzin and Lincon (2000) in qualitative research: *“the analyst’s task is to understand how this instance and its intersections work, to show what rules of interpretation are operating, to map and illuminate the structure of the interpretive event itself”* (Denzin & Lincon, 2000, p. 371). Whether the same expression occurs again is irrelevant, the sampling from a population is also not an issue since it is not possible to say on forehand of what an instance is a sample of (Denzin & Lincon, 2000). This means that there is little concern for empirical generalizability; the goal is not empirical generalization, but to provide an analysis which is uniquely adequate for the situation (Denzin & Lincon, 2000). If the theory should be generalizable it is advisable to empirically test the theory after the qualitative research, however this is outside the scope of this research.

Operationalization

This research focusses on the use of imagination in the decision making process by entrepreneurs. In order to check if the found theory on imagination holds in practice, and to see if the theoretical model comes close to practice, interviews with entrepreneurs were held. Besides this thesis on the role of imagination in strategic decision making by entrepreneurs, there was another researcher writing on the role of imagination in the idea generation process of entrepreneurs. To increase the total sample sizes for both researchers, the interview questions of both studies were combined into one semi-structured interview. The first part of the interview were introduction questions, the second part consists of questions related to the other researchers’ study and the third part of the interview consists of questions based on this study. Both researchers conducted each 10 to 15 full interviews and shared the anonymized data with each other, so the both researchers could study the data of their parts of the in total 25 interviews.

A combined questionnaire was developed (see: Appendix A: Interview questions (Dutch), and Appendix B: Interview questions (English)), so both researches could benefit from each other’s data. The interview was divided in to three main parts. First introductory questions were asked, to see if the entrepreneur has an understanding of what is meant by imagination, and if he uses it to envision company situations. Then the entrepreneur was given an explanation of the three forms of imagination, which were identified in the literature review, so they would know what was meant by imagination. This to make sure they would know what the questions mean, so they know what is asked, to improve the validity. .

The second part of the interview focusses on the use of imagination in the idea generation phase. And the third part focusses on the use of imagination in the decision making process. For the questions on the use of imagination in the decision making, the entrepreneur is asked to keep a recent strategic decision in mind. Then (in question number 6), the entrepreneur is asked to explain how he identified

the problem, which asked for a strategic decision. This question relates to the first proposition of the conceptual model. Then the entrepreneur is asked, if he developed multiple scenarios for this problem, and how this has helped him. This question related to the second proposition. And the next question asks if the entrepreneur uses his imagination for evaluating the various scenarios. This question relates to the third proposition. Then a fourth question is added, namely: if the entrepreneur has used input from others to steer the imagination process. This question controls, for the use of communication with others, and it might provide insights in the use of perspective taking. As an ending question the entrepreneur is asked, if he thinks if there are other important business related aspects in which imagination might be important?

Before analyzing the interviews it is important to look at the saturation. As Bertaux (1981) explains: the first interview teaches a lot of new insights, as do the second and third. However, when the fifteenth interview is held, a pattern becomes visible, and by the twenty fifth interview, the interviews do not reveal much new insights, and saturation is reached. Bertaux calls this the process of saturation of knowledge. When this is reached, the sample is representative, at the level of sociological relations however not at a morphological level.

Charmaz (2006) suggests that the aims of a study are the ultimate driver of the project design, and therefore the sample size. She suggests that a small study with "modest claims" might achieve saturation quicker than a study that is aiming to describe a process that spans disciplines⁴. In our case the goal is to check if the theory found through literature study, matches with practice. There are different guidelines, so do Adler and Adler in the paper of Baker and Edwards (2012) expect saturation to happen around twelve interviews, but this can of course differ in reality. The often pointed out sample size of fifteen by for instance Adler and Adler in the Article by Mason (2010). Is generally considered the minimum number of interviews. To further improve the chance of reaching saturation, data of ten additional interviews were used as well, to create a solid sample size. The total sample of entrepreneurs was twenty-five. Sixteen interviews were conducted by the author, and nine by a colleague master student.

The entrepreneurs in the sample should be operating in a High Tech environment, in micro to small size companies, and the entrepreneur should be experienced. All the entrepreneurs met the first two criteria, besides one. The company, in which the interviewed entrepreneur 17 operates, has a worldwide network and 500-1000 employees, however the part he is responsible for, operates as a smaller business unit. This is a different situation, but it is interesting to compare this entrepreneur to the others. Furthermore the entrepreneur with the lowest number of years of experience had around one and a half year of experience. One can argue if this is experienced enough, but in this paper the entrepreneur was included in the analysis. It was also interesting to find two female entrepreneurs, since this gives opportunity to compare gender and to see if they differ from the average sample of entrepreneurs. To provide an insight in the various markets the entrepreneurs operate in, a table is included below (see Table 1 sample of entrepreneurs).

⁴ Adopted from (Mason, 2010)

Entrepreneur	Market	Micro <10	Small <50	Large	Start-up year	Gender
Entrepreneur 1	Healthcare	x			2005	Male
Entrepreneur 2	Healthcare	x			2011	Male
Entrepreneur 3	Automation		x		1994	Male
Entrepreneur 4	Software	x			2008	Male
Entrepreneur 5	Engineering		x		1994	Male
Entrepreneur 6	Automotive	x			2003	Male
Entrepreneur 7	3d printing	x			2012	Female
Entrepreneur 8	Healthcare	x			2006	Female
Entrepreneur 9	Healthcare	x			2007	Male
Entrepreneur 10	Water Technology	x			2002	Male
Entrepreneur 11	Automotive		x		1999	Male
Entrepreneur 12	Simulation		x		1999	Male
Entrepreneur 13	Telecommunication		x		1993	Male
Entrepreneur 14	Healthcare	x			2006	Male
Entrepreneur 15	Healthcare	x			2008	Male
Entrepreneur 16	Healthcare	x			2008	Male
Entrepreneur 17	Automotive			500-1000	1970	Male
Entrepreneur 18	Semiconductor		x		2007	Male
Entrepreneur 19	Palletizing	x			2004	Male
Entrepreneur 20	Water Technology	x			1995	Male
Entrepreneur 21	Healthcare	x			1993	Male
Entrepreneur 22	Automation	x			2007	Male
Entrepreneur 23	Simulation		x		2011	Male
Entrepreneur 24	Automation		x		1975-1979	Male
Entrepreneur 25	Automotive		x		1981	Male

Table 1 sample of entrepreneurs

To ensure full cooperation and to prevent the interviewed entrepreneurs from withholding information, the interviews were treated anonymously. The full interview was recorded, and at a later stage these interviews were transcribed. The choice was made to check the transcription not only for signs of imagination, like perspective taking, prospective thinking, and counterfactual thinking, but also for other relevant non-imagination related aspects.

Memory is important since it is expected to be beneficial for the imagination, and it could be helpful in the decision making process. The use of analytical tools is seen as another method which can be used in the decision making; these represent the use of rational or mathematical tools, or other tools opposite of imagination. Communication is another aspect which could prove helpful in the decision making, and therefore this is also incorporated. After analyzing the interviews for the first time, the discovery was made that more than one entrepreneur talks about the benefits of a mixed team, the use of a larger goal, or that they are confronted with something for which they had to make a decision.

Therefore these were included and the analysis redone. In total the following codes were used in analyzing the transcribed interviews:

Codes regarding imagination theory	
Perspective taking	Seeing the situation through the eyes of another person, situation, product, item etc. Using your thoughts, to see something from another perspective
prospective thinking	Having thoughts about a future situation
counterfactual thinking	Having thoughts about how the current future would be different, if things in the past went differently. Also if things in the current state change, what will happen (seeing consequences, what if)
Codes regarding non-imagination theory	
Memory	Using knowledge, experience, and memory, so everything you learned and experienced
Analytical tools	When analytical methods, examples, or hard facts are used
Communication	When something is said about the communication
Codes regarding other important issues	
Goal	When the use of a bigger (long term) goal is mentioned
Mixed team	When something is said about the mixed composition of the team
Confronted	When the entrepreneur is confronted with a problem or situation he needs to make a decision about
Codes regarding other important issues	
Proposition 1	When something is found relating to the first proposition
Proposition 2	When something is found relating to the second proposition
Proposition 3	When something is found relating to the third proposition
Proposition 4	When something is found relating to the fourth proposition

Table 2 coding scheme used for analyzing the interview data

With these codes set, the transcribed interviews were analyzed. The analysis was as done as follows; the research focusses on the propositions regarding the use of imagination in the decision making process and the use of memory in imagination. When something was said about one of the four propositions (positive or negative), this part of text was copied into a table. This text was then analyzed regarding what exactly it said about the propositions, and the appropriate codes assigned. If in the explanation the code is not literally mentioned, but it was indicated, the code was also assigned. After this analysis of the copied text, a short explanation was written to indicate how things are interpreted. The formed table with all the relevant codes per individual entrepreneur was used to construct a larger table. This table represents the overview, which makes it easier to compare the results. Then another table was constructed in which the averages of different groups within the sample are compared.

4 Results

In this chapter the analysis of the results is discussed. First the findings are represented and compared, then the meaning for the propositions are discussed, and finally these findings are used to adapt or further define the conceptual model.

When looking at the transcribed interview data, no big anomalies appear to consist in the data. The sample size was large enough to let saturation occur. In order to see if saturation is reached, the answers from the last two entrepreneurs were compared with the other ones analyzed before. Since saturation means, that gathering more data would not result in more new insights, the answers from the last entrepreneur should not reveal any new insights. Of course there is no possible way to know if saturation truly is reached, until it is proven that it is not reached (the statement “all swans are white” hold until a non-white swan is discovered). But the results do not point out any new insights, and therefore saturation is believed to have been reached.

4.1 Analysis of the interviews

When analyzing the interviews it was important to think of what the entrepreneur really means, or how the process the entrepreneur describes goes. Following is an example showing this: entrepreneur 2 described and explained something as the following: he was working at a company with colleagues at developing a machine to detect certain cells. Then he had thoughts where this technology could be applied as well, and also because doctors asked him to research something for their problem, he went into developing some tools for detecting the cells.

One would be quickly tempted to say that he used perspective taking and communication with others to come up with a scenario right away and going for that one. However the underlying process is more specific. Why does the entrepreneur come up with this scenario right away, why did he ask himself this question? Probably he used perspective taking to see from the perspective of the technology (for which knowledge is required) and knowledge to see where this technology could be used. After identifying other areas, in which way this technology could be beneficial, different scenarios are made up for the different areas. Then using communication with doctors, and probably knowledge of the market to see if there is room for potential profit probably, making the decision.

After analyzing this part of text the following codes are assigned accordingly: prop1 (perspective taking, memory) prop2 (perspective taking, memory) prop3 (communication). Prop1, prop2, and prop3 refer to the propositions, which refer to the different steps of the decision making process. In the third proposition memory is not written, because it is assumed that market knowledge is used, but he only stated the use of communication. Perspective taking and memory are both clearly present in his explanation, and are therefore coded this way.

Overall results

After all the interviews were analyzed, a table was created (see Table 3 results). The choice was made to not only put the use of a code in the table, but also the amount of times it was used. This is not completely representative for the total population, since one entrepreneur can influence the scale by mentioning it a lot, however this can give a big insight into the usage of the different forms of imagination or non-imagination items. The table is made up as follows. On the left side the different used codes are divided into three boxes for the different propositions, and the fourth proposition without extra codes on the bottom. The 25 entrepreneurs are marked on the top, and the totals on the right.

entrepreneurs		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total	
prop 1	perspective	2	4	2	2	1	2	3	1	5	4	9		4	2		4		3		1	1	4	3		3	60	
	prospective	1	2			2	1	2	1	4	1	4	1		3	1	2		2	1	2	2	1	3	1	6	43	
	counterfactual	1	1	2			2		3	4		3	2	1	1	1		1	1	4	3	4	1	1		2	38	
	memory		5				1		1	1		1		1	1	1	5		1	1	1		3	4		1	28	
	analytical tools				1	1					2						1	3			1	1		2		2	14	
	communication		2	1	2	1	1	2	2		1	6	1				1	2	1	3		1	3	2	2		2	36
	mixed team		1					1				1												1			4	
	confronted			4	1	3	2		6	1	3			3				1	2	1	2	5	2	4		1	41	
prop 2	memory				1								1														2	
	analytical tools																	1									1	
	communication		2	1					2				2	1													8	
	scenarios	2	8	6	4	2	4	1	4	1	5		2	2	5	2	5	4	3	3	3	3	7	4		5	85	
prop 3	perspective	1	2	3	3	2	4	3	4	1	1	1	1	2	6	2	3	1	3	4		2			1	2	52	
	prospective	1				1	2			1					1				1						1	2	10	
	counterfactual			2			1	1	1					3	4	2		1	1	2	2	1		1	2	2	26	
	memory		1	5	2	5	4	1	1		3	4	2	1	1		1		4	2	2	1			2	5	47	
	analytical tools			1	1	3	4	2			1		2	1	1			1			3	1				7	28	
	communication	1	1	1	2	1	3	2	3	1	8	2	2	1	2		2	1	4	2	4	1	2	2	1	6	55	
	mixed team				1																					1	1	
	goal	1				2	4	4	1	1	3	1			2	1	2	3	2		4	2	2	3	3	4	45	
prop 4		1	1					1		1											1				1		6	

Table 3 results

Some interesting differences are present within the sample size, two female entrepreneurs are present, some small companies, some medium companies, and one large company, and then there is also the difference in age. These differences are interesting to compare. In the table below (see Table 4 comparison results) this comparison is made. All the averages per group are calculated, and then these averages are compared with the overall average. Only the averages which differ more than 0.5 are shown. As one can see, the female entrepreneurs mentioned the use of memory 0.6 points less than the average times it was mentioned. The same holds for the use of analytical tools. However communication was 0.6 higher. These differences are not so large, since there were only 2 female entrepreneurs in the sample. What does point out some differences is that female entrepreneurs are

more often confronted with decisions, than the average. This is mentioned 1.4 times more than the average. They also state the use of perspective taking more in evaluating the scenarios. They also state the use of memory in evaluation and the use of scenarios more than the overall average.

One very interesting point is: the big differences on the use of memory in the evaluation of the different scenarios. As one can see, the average number of times it is mentioned is 1.88, the average of small companies is 0.6 *lower*, the medium companies average is 1,2 *higher*, and the large company is 1.9 lower (which means it is not mentioned). For the large company this is not so shocking, since there was only one in the sample, however the difference between the small and medium sized companies is very surprising. There were 15 small and 9 medium sized companies. As it appears, the small companies use less experience and knowledge in the evaluation of the various possible scenarios, and the medium companies use more experience and knowledge. This phenomenon is also seen in the age, but since in most cases the younger companies are still small, since they didn't grow yet, this is probably the same phenomenon. For the rest, there are no big differences for the small and medium companies.

What is strange, that the companies older than 10 years mention the use of knowledge or experience to get ideas for making a decision, while the younger entrepreneurs, which do not have as much experience as the entrepreneurs of older companies, use their experience more. However the more experienced entrepreneurs use less memory and analytical tools in the process of evaluating the different scenarios. What this tells is that the more experienced entrepreneurs do not use their experience to come up with ideas, it could be that they already fulfilled all of their ideas, but when it comes to the evaluating of possible scenarios, they use more experience, knowledge, as analytical tools. This could be interesting to research further, this further discussion lies outside of the scope of this research.

Entrepreneurs	Overall average	Female average	Small companies	Medium companies	Large companies	Before 2003	After 2003	Overall -fem	Overall -small	Overall-medium	Overall -large	Overall - 2003<	Overall -2003>
prop 1	perspective	2,4	2,0	2,3	2,8	0,0	2,3	2,5				2,4	
	prospective	1,72	1,5	1,6	2,1	0,0	1,7	1,7				1,7	
	counterfactual	1,52	1,5	1,7	1,3	1,0	1,6	1,4				0,5	
	memory	1,12	0,5	1,3	0,9	0,0	0,4	1,7	0,6			1,1	0,8
	analytical tools	0,56	0,0	0,4	0,6	3,0	0,9	0,3	0,6			-2,4	
	communication	1,44	2,0	1,3	1,8	1,0	1,5	1,4	-0,6				
	mixed team	0,16	0,5	0,1	0,2	0,0	0,1	0,2					
	confronted	1,64	3,0	1,8	1,3	2,0	2,1	1,3	-1,4			-0,5	
prop 2	memory	0,08	0,0	0,1	0,1	0,0	0,1	0,1					
	analytical tools	0,04	0,0	0,0	0,0	1,0	0,1	0,0				-1,0	
	communication	0,32	1,0	0,3	0,4	0,0	0,4	0,3	-0,7				
	scenarios	3,4	2,5	3,8	2,7	4,0	2,9	3,8	0,9	0,7	-0,6	0,5	
prop 3	perspective	2,08	3,5	2,4	1,7	1,0	1,5	2,6	-1,4			1,1	0,6
	prospective	0,4	0,0	0,3	0,6	0,0	0,4	0,4					
	counterfactual	1,04	1,0	0,9	1,2	1,0	1,2	0,9					
	memory	1,88	1,0	1,3	3,1	0,0	2,7	1,2	0,9	0,6	-1,2	1,9	-0,8
	analytical tools	1,12	1,0	0,9	1,6	1,0	1,8	0,6				-0,7	0,5
	communication	2,2	2,5	2,3	2,2	1,0	2,5	1,9				1,2	
	mixed team	0,04	0,0	0,1	0,0	0,0	0,0	0,1					
	goal	1,8	2,5	1,8	1,7	3,0	2,0	1,6	-0,7			-1,2	
prop 4		0,24	0,5	0,3	0,1	0,0	0,3	0,2					

Table 4 comparison results

Propositions

The data is analyzed to prove insights on the propositions made earlier. The following propositions were created:

Proposition 1: *In the problem identification phase all three forms of imagination will be used.*

Proposition 2: *With the generation of possible alternative options prospective and counterfactual thoughts will be mostly used.*

Proposition 3: *In the evaluation of the alternatives and selection of the option counterfactual thoughts and perspective taking will be mostly used.*

Proposition 4: *The imagination is influenced by memory*

Proposition 1

After doing the literature research the theory was formed that all the three forms of imagination are used to identify a problem. As visualized in Table 3 results", the entrepreneurs did use all types of imagination in the identification of the problem. Only 5 entrepreneurs did not mention the use of perspective taking, the other twenty entrepreneurs mentioned using perspective taking. The use of prospective taking is mentioned by twenty-one entrepreneurs and nineteen entrepreneurs used

counterfactual thinking. Some of the entrepreneurs do not use all of them, but thirteen entrepreneurs used all of the different forms of imagination. So indeed, as expected in the proposition, all the forms of imagination were present in the problem identification phase.

Through the analysis of the data, a very interesting discovery was made: in the problem identification phase, the entrepreneur can also be confronted with a problem. So there are two ways in which a problem or situation in need of making a decision, can be discovered. It can be discovered through the actions of the entrepreneur, or the entrepreneur can be confronted with a problem. In total the confrontation with a problem, and not looking for it themselves was mentioned forty-one times. It varied from questions from customers or potential partners, to investors asking things, then the entrepreneur has to create different scenarios, there are always at least two scenarios, obeying or not obeying the question, and making a decision. The following methods were found:

Perspective taking: This is mentioned sixty times. An entrepreneur can use the perspective of for instance the technology to come up with a new application. And subsequently decisions to be made.

Prospective thinking: This is mentioned forty-three times. An entrepreneur can imagine a future state, and can then see if the current company is ready, or if scenarios need to be made, since a decision is needed.

Counterfactual thoughts: This is mentioned thirty-eight times. An entrepreneur can have thoughts about what would happen if certain circumstances change. They can for instance think what would happen if a large supplier goes bankrupt, and then discover that they need to think of scenarios.

Memory: This is mentioned twenty-eight times. An entrepreneur can use his experience and knowledge in coming up with an idea and therefore needing decisions. Often this is also used together with the other codes in this step. For instance an entrepreneur can use his experience with a technology, and together with perspective taking see other areas to make scenarios for.

Analytical: This is mentioned fourteen times. Some entrepreneurs look at examples to get input for creating scenarios, or use certain business scans to discover weak or strong points and then make scenarios to steer towards an area.

Communication: This is mentioned thirty-six times. It can happen that an entrepreneur talks to someone and gets an idea through this conversation. The communication can also help to identify a problem.

Mixed team: this is mentioned four times. Having a mixed team surrounding the entrepreneur is beneficial, since through communication with this team the entrepreneur can get new ideas. The different backgrounds and perspectives help with this.

So the proposition that all the three forms of imagination were used to discover or identify the problem was correct. However there are other aspects used as well.

Proposition 2

After the literature, counterfactual thoughts and prospective thoughts were expected to be used most by entrepreneurs when coming up with scenarios. In the analyzed data only two entrepreneurs did not mentioning using scenarios. In total the entrepreneurs named the use of scenarios in decision making 85 times. The entrepreneurs did explain they used scenarios, but not really how these scenarios were formed. It could be because this is the creative leap, in which at first you do not have an idea, but then all of a sudden you know the answer. So it is probably not a conscious happening. This is also pointed out by entrepreneurs 2 and 20: the scenario (or in their words solution) came to them at night. They woke up and suddenly they had this idea of how to solve a problem. So this indicates that it is not a conscious process. However there are some clues where some scenarios can come from:

Memory: This is mentioned twice. The entrepreneurs can get the idea for a scenario, because they have experienced something similar.

Analytical tools: This is mentioned once. The entrepreneur explained that he tries to look for examples to get inspiration for creating scenarios. And examples are defined in this interview as being part of an analytical non-imagination method.

Communication: This is mentioned eight times. If one entrepreneur finds it difficult to form a scenario, he can ask others to form it for him, or the communication assists in the process, because others have other perspectives.

The entrepreneurs did also point out some other interesting things. Sometimes from the group of scenarios multiple scenarios are chosen. Entrepreneur 18 for instance works on multiple opposing scenarios. The machines he sells are so valuable, that not making a sale could threaten the survival of the company, and since it takes much time to start and develop a different scenario, he is simultaneously implementing a scenario already which should come into practice when not making the sale. Entrepreneur 9 sometimes also implements multiple scenarios. He filters which scenarios are possible, and he sometimes does not make a final decision, but implements both, and sees which one proves more effective, and then sticks with that one. Other entrepreneurs also think of multiple possible scenarios, for problems or situations not yet at hand. However they do decide on what scenarios they are going to pursue when something happens.

Since the data does not point out origins of the scenarios, it remains inconclusive if imagination is used.

Proposition 3

An important new insight regarding the evaluation of possible scenarios was found. Sometimes an entrepreneur has a bigger or long term goal, which he uses to judge the scenarios. This vision is a long term goal, and the scenarios, are extrapolated to see if this scenario will help to achieve the goal. This is very interesting, since the entrepreneurs use a scenario to evaluate the other scenarios. If the goal is to grow to a company into a certain direction, the other scenarios are judged to see if they move toward the large direction. As an example, if the goal for instance is to earn the most money,

then a company which starts out as a tire shop can end up as a travel agency, because the goal is based on money, this can happen. If the goal is to be the best tire shop, then the scenario of going into traveling would be probably disapproved. So this is a very interesting finding. The use of a goal in evaluating the scenarios was mentioned forty-five times and in total by eighteen entrepreneurs, so it is also quite commonly used.

Following from the literature review, the proposition was formed that: mostly perspective taking and counterfactual thinking are used in the evaluation of the scenarios. These types of imagination were indeed used in evaluating the scenarios, but other things were used as well.

Perspective taking: This was mentioned fifty-two times. The entrepreneur can take the perspective of for instance a potential customer, and see which scenario is more appropriate. The entrepreneurs also use this to see if a potential partner would value a certain strategy.

Prospective thinking: This was mentioned ten times. The entrepreneurs use prospective taking to mentally create an image of the future; this helps the entrepreneur to see who the scenario will work for the future.

Counterfactual thinking: This was mentioned twenty-six times. The entrepreneurs can use this often called the 'what if' way of thinking, to imagine a different reality when something changes. They can for instance think of what will happen if they work with partners, or without.

Memory: This is mentioned forty-seven times. The entrepreneurs use their experience and knowledge in the evaluation of the different imagined scenarios.

Analytical tools: This is mentioned twenty eight times. The entrepreneurs can use certain analytical methods, such as market research, to make an estimate of which scenario should have the best likely result. The use of examples is also seen as analytical tools.

Communication: This is mentioned fifty-five times. The entrepreneurs communicate with people inside and outside the company. What is often seen is that the entrepreneur discusses with the customer to get input for his evaluation. Entrepreneurs also discuss it with their team inside the company, and some go to meetings with other entrepreneurs to discuss such issues.

Mixed team: This is mentioned once. Following the communication in the team, it is helpful to have people from different background surrounding the entrepreneur, so the entrepreneur has a bigger source of input for his evaluation.

The proposition that entrepreneurs mainly use perspective taking and counterfactual thoughts was to some extent true. From the imagination used in the evaluation of the different scenarios, indeed perspective taking and counterfactual thinking are mostly present. However besides these, other non-imagination methods are used as well, of which memory, communication and a bigger goal are the three most mentioned.

Proposition 4

The last proposition was based on the belief that knowledge and experience, also related to memory, influences the imagination. The choice was made not to ask specific questions about this, in the question list, since it does not relate to the main question. But since it was an interesting finding in the literature, the choice was made to include it in the analysis.

In total six entrepreneurs mentioned this phenomenon. Entrepreneur 24 said that he actively experiences new things and talks to others in order to feed his imagination. However it could be that this relation is present, but since it was excluded in the questions, the data is expected to be inconclusive enough to validate the fourth proposition.

4.2 Improved conceptual model

Since the interviews with the entrepreneurs revealed more insights in what way entrepreneurs use imagination in the decision making process, the conceptual model could be further improved or adapted. The following things have been adapted in the model:

The reducing effect of the risk and uncertainty is left out of the improved model. In the analysis there was no indication found on this relationship. The contributing factor of having a mixed team which was pointed out by the analysis is not incorporated, because it helps through communication, just having a mixed team, does not improve anything, because you still need to ask them for advice. The discovered situation of being confronted with a problem, rather than identifying the problem yourself, is not included in the model, since this happens and it is not something you can consciously plan or use. The relationship between memory and imagination was not validated, and therefore this is also left out of the improved version.

In the initial model, there were only memory and imagination present in the decision making steps. However since the analysis revealed the use of other non-imagination methods as well, the improved model is made more specific. The methods are grouped into non imagination and imagination methods. Then the propositions are included, so the arrows which indicate the relationships are incorporated in the model to show the influence of the individual methods. So this makes the model more specific.

Since some entrepreneurs, as entrepreneur 2 point out, the process of going from the generation of possible options/scenarios to evaluating these scenarios and picking one should be reciprocal. When the thought up scenarios prove not to be relevant for solving the problem at hand, the problem remains, but new scenarios need to be constructed. So it is an iterative process.

And finally the discovery of the use of a bigger goal in the evaluation of the options is included. This is visualized by an independent box, since the goal itself is not imagination, but imagination is needed to see in the evaluation if the goal is met or not. This box is therefore in-between the imagination and non-imagination.

Below is the adapted conceptual model, see Figure 2 Improved conceptual model of entrepreneurial decision making”. Instead of using arrows to indicate the relations, the choice is made to use colors. All the arrows would make it hard to see the overview. The colored and numbered boxes next to the blue boxes of the decision making steps, represent the relationship.

The adapted model shows what type of tools the entrepreneurs use in the different steps, but one should keep in mind that the model is a conceptual visualization of how the decision making processes of entrepreneurs works, it is not a model for making the best strategic decisions.

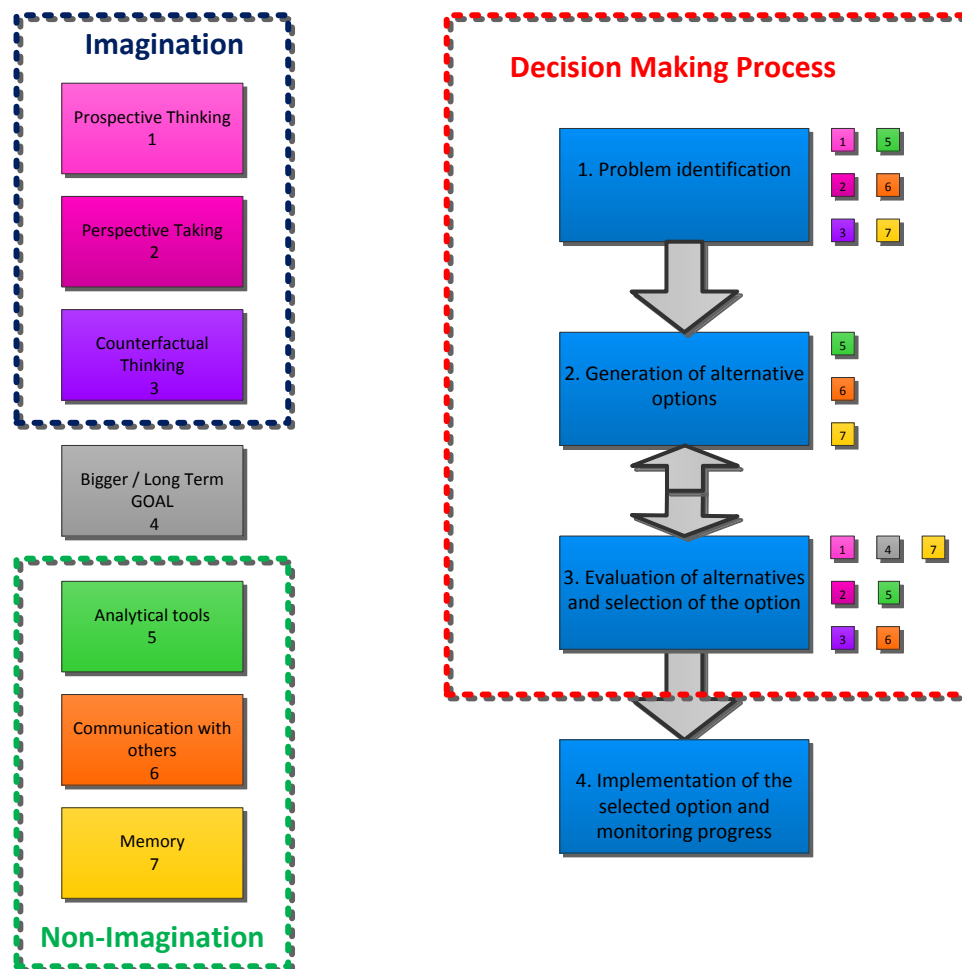


Figure 2 Improved conceptual model of entrepreneurial decision making

5 Conclusion

In this chapter the main findings of the research will be discussed. First the conclusions and the discussion will be explained. After which the limitations will be discussed and last there will be some suggestions made for future research.

5.1 Conclusion/discussion

The aim of the research was to explore the use of imagination by entrepreneurs. The focus was placed on the decision making process. The main research question formulated at the beginning of this research was as follows:

- How is imagination used in the process of entrepreneurial decision making?

The formed sub questions to make the main question more specific were:

- Does entrepreneurial decision making differ from general decision making?
- What are the important aspects of imagination?
- Do entrepreneurs use imagination in the entrepreneurial decision making process?
- Where in the entrepreneurial decision making process do entrepreneurs use imagination?
- What is the purpose of imagination in the entrepreneurial decision making process?

Entrepreneurial decision making

The entrepreneurial decision making process differs from the normal decision making process, because entrepreneurs often face an environment which is characterized by unpredictability, volatility and dynamism (Chia, 1996), so it is hard, if not impossible to use rational and analytical methods. It is impossible to fully determine consequences and possibilities in unstable environments and experimental situations. It is under those conditions when entrepreneurs use imagination to create novel opportunities that have gone unnoticed or unimagined by others (McVea, 2009). The entrepreneurs are facing high time pressure for their decision making. Therefore this research investigates the use of imagination by entrepreneurs.

Aspects concerning imagination

Within the imagination research, three different forms of imagination were identified in literature: perspective taking, prospective thinking, and counterfactual thinking, (Frederiks, Ehrenhard, & Groen, 2012b).

Perspective taking, is the ability to put oneself in the position of someone else (Frederiks, Ehrenhard, & Groen, 2012a). In the high-tech industry successful entrepreneurs manage to match technical discoveries with the buyers' needs (Markman & Baron, 2003). This ability to match technical discoveries with the buyers needs is very important (Markman & Baron, 2003). In the interview with entrepreneurs, all of the entrepreneurs explained that they indeed used perspective taking. They use perspective taking, to see what the customer wants. What was surprising to find is that some entrepreneurs take the perspective of a product or technology and from that perspective identify what

customers would benefit from this technology. This is in line with what Markman & Baron (2003) stated above, the ability to match technological discoveries with the buyers.

Prospective thinking is used to think of the future. Prospective thinking consists of the words thinking and prospective: *“prospection refers to our ability to ‘pre experience’ the future in our minds”* (Gilbert & Wilson, 2007, p. 1352). So prospective thinking refers to thinking in which the future is pre experienced. In the interviews with entrepreneurs, all of the entrepreneurs used prospective thinking to think of the future, because the entrepreneurs pre-experience the future, they can see if the company in the current state is ready for this future. If this is not the case they can prepare strategies to plan for this future.

Counterfactual thinking is the mental simulation which can be used to assess why the current situation is as it is (Vanharanta & Easton, 2010). It is the process of thinking about how this current situation has become what it is, or thoughts about what could have been different in the current situation if things had went in a different way (Landman & Petty, 2000). Byrne (2005) describes counterfactual imagination as speculations and thoughts about what might have been important in a past situation. Baron (2000) suggests entrepreneurs are less likely to engage in counterfactual thinking. This also became clear in the interviews. Only three entrepreneurs used counterfactual thinking to think of the past. However the entrepreneurs use counterfactual thinking to think of alternative outcomes to present or future events. This paper agrees that the counterfactual thinking can also be used in the present or future.

Imagination used in the decision making process by entrepreneurs

The entrepreneurs do indeed use imagination in the decision making process. The analysis revealed that entrepreneurs use perspective taking, prospective thinking and counterfactual thinking in the problem analysis phase. In the phase where scenarios are thought up, there is not enough data to enclose or disclose the use of imagination. It could be that this process is a non-conscious process, which means that the entrepreneurs are not controlling the process, but it just happens. Some entrepreneurs also indicate that they woke up in the middle of the night with an idea, which points also to the non-consciousness.

When the alternative options or scenarios are thought off, the entrepreneurs use perspective taking, counterfactual thinking and to a lesser extend prospective thinking in the evaluation process before selecting an option.

However next to imagination, the entrepreneurs use also non-imagination methods such as an analytical analysis, knowledge and experience, and communication in the decision making process. Another important finding is that entrepreneurs use a set bigger/ long term goal which is used in evaluating the possible options / scenarios. This goal is a scenario or vision formed through prospective thoughts. As an example a company is now producing winter tires. If the entrepreneur has the bigger goal of becoming the market leader in tire manufacturing, then a scenario of diversification into making winter tires is picked over a scenario of making wheel nuts. Although the wheel nuts might prove a smarter move in the end.

So to answer the main question: how is imagination used in the process of entrepreneurial decision making? The entrepreneurs use perspective taking, prospective thinking and counterfactual thoughts to help identify a problem, and to evaluate the possible alternative options / scenarios.

5.2 Limitations

There are some limitations to keep in mind when using the findings of this research. It is important to notice that this research looked at the way entrepreneurs use imagination in their decision making process. A conceptual model is created to visualize the way in which entrepreneurs use imagination. This research however did not point out that the use of imagination is beneficial. The entrepreneurs explained they use it, and they see it as beneficial. However imagination can also create biases such as: overconfidence, the law of small numbers, and illusion of control (Simon, Houghton, & Aquino, 2000). These limitations should be kept in mind when thinking of imagination, or using the model.

Overconfidence refers to the failure to understand the limit of one's knowledge, and occurs often because individuals do not sufficiently revise their initial estimates after receiving new data (Simon, Houghton, & Aquino, 2000). If people imagine or explain a causal scenario, they become more confident about that scenario (Escalas, 2004). Illusion of control refers to the situation in which an entrepreneur might over-empathize the extent to which his skill can increase performance, while it is an effect of a random event (Simon, Houghton, & Aquino, 2000). The law of small numbers refers to the belief in only a small number of inputs, and the drawing of firm conclusions from that (Simon, Houghton, & Aquino, 2000).

The sample of entrepreneurs interviewed in this research is specific. The interviewed entrepreneurs were located in the middle - east part of the Netherlands. The experience level of the entrepreneurs varied but most the entrepreneurs were experienced. The companies of the interviewed entrepreneurs were small to medium sized enterprises. All of the companies were active in a high tech environment, to see the specific markets they operated in see Table 1 sample of entrepreneurs. When making generalizations to other entrepreneurs or companies, this should be kept in mind.

This research used the data derived from twenty-five interviews with entrepreneurs. There were no big anomalies found in the data, and saturation was expected to be reached; however saturation can only be proven wrong if an anomaly is found. This should be kept in mind.

To further improve generalization of the findings, a larger empirical study is advisable. What is also advisable is to do an extensive literature review on the formation of scenarios, ideas or options, since it could be that imagination is used in that part as well.

5.3 Suggestions for further research

The aim of this research was to explain the topic of imagination used by entrepreneurs. A theory was developed from a literature review. In order to see if this new theory holds, entrepreneurs were interviewed. In order to make the claims of this research more generalizable and to improve validity, it is advisable to do an empirical study with a large sample.

The findings of this research as a first step look promising, in identifying possibly the missing link in entrepreneurial success. However since the entrepreneurs themselves state they value the use of imagination, it is advisable to look for a relation between the use of imagination and different measures for firm success in further research.

It could be that having a mixed team to communicate to when making decisions, could also provide an interesting topic for further research. Some entrepreneurs spoke about the benefit of people with mixed backgrounds; however this was outside of the scope of this research to fully investigate. It could also be that the members have mixed background, they imagine things differently, and therefore the entrepreneur can collect these different imagined thoughts to get a better overall view of the matter at hand. This could be an interesting topic for further research.

The perspective taking used to identify a problem, could be dependent on the business strategy. It could be that entrepreneurs using a push strategy use it more than entrepreneurs using a pull strategy. Since entrepreneurs using a pull strategy act upon customer's request, they have more direct communication, and do not need to envision the need of that customer anymore.

The proposition that knowledge and experience are influencing the imagination was not incorporated in the interviews. However some entrepreneurs did point out this influence. Also if you go back to the basics, one needs to have some knowledge, in order to envision something. One can for instance imagine a flying car, however if there is no knowledge one cannot imagine a car, or know what flying is. Therefore this could be an interesting topic to research.

If one is interested in decision making, it could be interesting to research the use of knowledge and experience, also called memory and analytical tools in decision making. In the interviews some entrepreneurs explained they used it, however no specific questions were asked since this research mainly focuses on the use of imagination in the decision making. To fully understand this, a literature review should be done to develop a better understanding of this, and the phenomenon further researched.

In order to further understand the entrepreneurial decision making, another research method can be used. The creation of an experiment in which entrepreneurs are tracked while making several decisions might provide important insights and more specific data on the topic. When the entrepreneur can be monitored while making the decision, such as in a computer program, it might be easier to see exactly how the entrepreneur tackles the decision. The entrepreneur can be also presented with some options such as communication with others, market research as an analytical tool to use, so the exact process could be tracked real time. This could be another interesting input for further research, however before that a more elaborate literature review should be held. All these above mentioned topics could be interesting for further research.

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Appendix A: Interview questions (Dutch)

Inleiding

1. Wat is volgens u verbeelding(skracht)?
2. Verbeeldt u zich wel eens bedrijfssituatie en zo ja, kunt u hiervan wat voorbeelden geven?
3. Hebben deze verbeeldingen volgens u effect op de bedrijfsideeën en strategieën in uw bedrijf?

<< Hier uitleggen over drie typen imagination: Prospective thinking, counterfactual thinking, en perspective taking >>

Idea Generation

4. Hoe gebruikt u uw verbeelding(skracht) om uw bedrijfsidee te ontwikkelen?
5. Heeft u zich hierbij verplaatst in de situatie van mogelijke klanten/suppliers? Zo ja, hoe heeft dit u geholpen?
6. Hoe is uw verbeeldingsproces beïnvloed door interactie met anderen?

Decision Making

Voor de volgende vragen, denk aan een recente, belangrijke strategische beslissing.

7. Hoe hebt u het probleem, dat aan deze beslissing vooraf ging, geïdentificeerd?
8. Hebt u na deze probleemidentificatie meerdere scenario's ontwikkelt? Zo ja, hoe heeft dit u geholpen?
9. Hoe hebt u bij de evaluatie van de scenarios gebruik gemaakt van uw verbeelding(skracht)?
10. Hoe is uw verbeeldingsproces beïnvloed door interactie met anderen?

Afsluiting

11. Wij hebben gesproken over de invloed van verbeelding bij het ontwikkelen van bedrijfsideeën en strategieën. Zijn er andere aspecten waarbij u uw verbeelding gebruikt? Zo ja, kunt u dit toelichten?

Appendix B: Interview questions (English)

Introduction

1. What is imagination according to you?
2. Do you use it to imagine a business situation, if so could you give an example?
3. Do these imagined business situations affect the business ideas and strategies?

<< Explain the three forms of imagination: prospective thinking, perspective taking, and counterfactual thinking >>

Idea Generation

4. How do you use imagination to develop your business ideas?
5. Did you take the perspective of possible customers/suppliers? If so, how did this help you?
6. How is the imagination process influenced through the interaction with others?

Decision Making

For the next questions, keep a recent strategic decision in mind.

7. How did you identify the problem which preceded this decision?
8. Did you develop more scenarios after the problem identification phase? If so, how did this help you?
9. How did you use your imagination in evaluating the scenarios?
10. How is your imagination influenced through the communication with others?

Closing part

11. We discussed the influence of imagination in the developing of business ideas and strategies. Are there other aspects in which you use imagination? If so, could you explain?